NK

PCT/AU00/00644

10/009232

AU00/644

4

Patent Office
Canberra

REC'D 18 JUL 2000
WIPO PCT

I, LEANNE MYNOTT, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 0851 for a patent by JAMES FREDERICK MORRIS filed on 08 June 1999.

WITNESS my hand this
Twenty-seventh day of June 2000

L. Mynott

LEANNE MYNOTT
TEAM LEADER EXAMINATION
SUPPORT AND SALES

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH
RULE 17.1(a) OR (b)

JAMES FREDERICK MORRIS

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

IMPROVEMENTS IN ELECTROMAGNETIC TRAFFIC SIGNAL DETECTION

The invention is described in the following statement:-

The present invention relates to improvements in electromagnetic traffic signal detection wherein a loop of electrically conducting material is laid on or set into the pavement surface of a roadway or the like. The loop provides means to detect the presence of a motor vehicle or the like passing thereover by means of the disturbance of the electromagnetic signal by the metal body of the vehicle passing over the underlying loop. The disturbance of the electromagnetic signal can be used to activate traffic lights, a boom gate, or the like.

Electromagnetic signal detection systems are one of several means for detecting the presence of motor vehicles or the like and for controlling or regulating traffic flow. Other detection means include but are not limited to infra-red systems wherein a passing vehicle breaks a beam of infra-red light between two pre-determined points, and pressure-sensitive systems, wherein the weight of a vehicle passing over a pressure-sensitive detector set in or on the road pavement activates the traffic lights, boom gate or other traffic control means.

Electromagnetic signal detection systems are perhaps now the mostly widely used traffic control or traffic regulating system because of their adaptability or versatility, their cost compared to other systems, and their reliability. This is especially so in applications for traffic control on public roads and car parking stations. However, the cost of installation of such electromagnetic signal detection/traffic control systems is relatively high, being both labour intensive and capital equipment intensive, as well as being time consuming.

Existing electromagnetic traffic signal detection loops are retrofitted to the road pavement after the pavement has been laid. This requires that a groove be saw cut into the pavement base or surface layer which damages the integrity of the road pavement, manually installing a loop within the groove and then sealing the groove with a settable filling material. This process is very labour intensive and time consuming. Further, it has a potential for environmental pollution, and control measures are required to prevent the asphalt and water slurry from the saw cutting from entering the stormwater system, including sediment control weirs and filters.

It is an object of the present invention to provide an improved installation method for an electromagnetic traffic signal detection or traffic control system which goes at least some way towards overcoming or at least minimising the prior art problems or limitations referred to above.

It is another object of this invention to provide an improved electromagnetic traffic signal or traffic control system which is universally adaptable for use in most traffic control applications.

It is a further object of this invention to provide an improved electromagnetic traffic signal detection or traffic control system which is relatively simple and inexpensive to manufacture, is easier and less expensive to install than existing systems, and is simple and reliable in operation.

These and other objects of this invention will become more apparent from the following descriptions and the drawings.

According to one aspect of this invention there is provided an electromagnetic traffic signal detection or traffic control system which includes one or more electromagnetic traffic signal detection loops comprising a pre-wound electrically conducting material in one or more interconnected loops of a predetermined configuration, encapsulated in a protective coating or layer, such as a protective bandage, or by other suitable insulating means, such that the signal detection loops may be inlaid as a single unit within the pavement structure, such as during the construction of the road, or during maintenance or repair thereon. The signal detection loops are operatively connected to traffic signals, a boom gate, or other traffic control or regulating means, whereby the electromagnetic signal disturbance created by the magnetic field of a metal vehicle passing over the loop activates the traffic control or regulating means.

This invention will now be further described by way of example only with reference to the accompanying drawings, wherein

FIG. 1 is a plan view of a typical traffic signal detection loop installation according to one embodiment of the invention;

FIG. 2 is a cross-sectioned view of a section of a typical road pavement construction, showing a cross-section through one section of a traffic detection loop laid on the road pavement base, encased in a protective bandage and covered by a top coat of asphalt; and

FIG. 3 is a cross-sectional view through one section as installed in a concrete road pavement.

As shown in the drawings relating to this embodiment of the invention, the electromagnetic traffic signal detection loops are pre-wound and encapsulated in a protective bandage so that they may be inlaid as a single unit within the pavement structure during the construction of the road.

Each set of loops come packed as a single unit, ready to install.

Installation of loops to the road base course takes a fraction of the time that is required for the installation of loops that are *cut* into the surface of the road.

Because the loops are encapsulated in a protective membrane or bandage, they can be exposed to vehicular traffic for a number of days after installation, without damage to the loop wires.

The loops are installed between the layers of asphalt during the construction of the asphalt road pavement. Therefore eliminating the need to saw cut the road surface, which adversely affects the integrity of the pavements structure. Ezy Loops can be installed on to any sound flat surface, then overlaid with an asphalt wearing course.

The loops can be installed into a concrete road pavement during construction by tying the loop to the top layer of reinforcing steel mesh.

Advantages of this method of installation of electromagnetic traffic signal detection loops include:-

- no electrical certification required for installation of the loops to the road base;
- no power tools are required for installation of the loops;
- the loops can be formed to suit any traffic lane width and any traffic carriageway, including for example conventional motor vehicle traffic, light rail, parking station entrances, to name a few; and
- the loops can be formed to suit any electromagnetic loop configuration. Standard widths are, for example, 1.6m, 1.8m, 2.0m and 2.2m.

The bandage encapsulated loop ensures that the loop remains in the desired shape or configuration, and serves to protect the wires of the loop during transportation and installation, such as during periods when the loop is laid out on the pavement and exposed to traffic, but is not yet covered by the top layer of asphalt.

Ensures Ezy Loops remain in their designed shape.

Protects the wires during transportation, installation and if left open to vehicular traffic.

The bandage used to adhere the loops to the road base with the assistance of a light rubber roller. No other processes are required to adhere the loops to the base. The loops can be adhered to a cold base, (i.e. profiled concrete or old asphalt pavement).

Installation onto Base Course

Once the base course has been prepared, i.e. profiled, milled and cleaned in the case of an existing pavement, or layed and rolled in the case of a new pavement, remove the loops from their packing unfold them and place them on the ground in the correct position over the marks. Secure the loops by using the protective bandage. Using a hand roller, roll the loops so that they adhere to the base. Lay the leader wires out so that they intersect the lip

of gutter adjacent to the PJ box. Cut a piece of bitumen bandage the length of the leader wires, peel the backing paper off and lay the bandage over the wires. Use the roller to press the bandage down. Remove the corking from the conduit leading to the PJ Box and feed the leader wires through. Recork the gutter groove and conduit. The surface layer of asphalt can now be laid over the loops and rolled. This method can be used if the temperature of the base course is over 100℃, but it is preferable that the temperature is below 80℃.

Although an exemplary embodiment of the present invention has been shown and described, it will be apparent to those having ordinary skill in the art that a number of changes, modifications or alterations to the invention described herein may be made, none of which depart from the spirit of the present invention. All such changes, modifications, and alterations should therefore be seen as being within the scope of the present invention.

It should be appreciated that the present invention provides a substantial advance in electromagnetic traffic signal detection and traffic control providing all of the herein-described advantages without incurring any relative disadvantages.

Dated this 8th day of June 1999

JAMES FREDERICK MORRIS

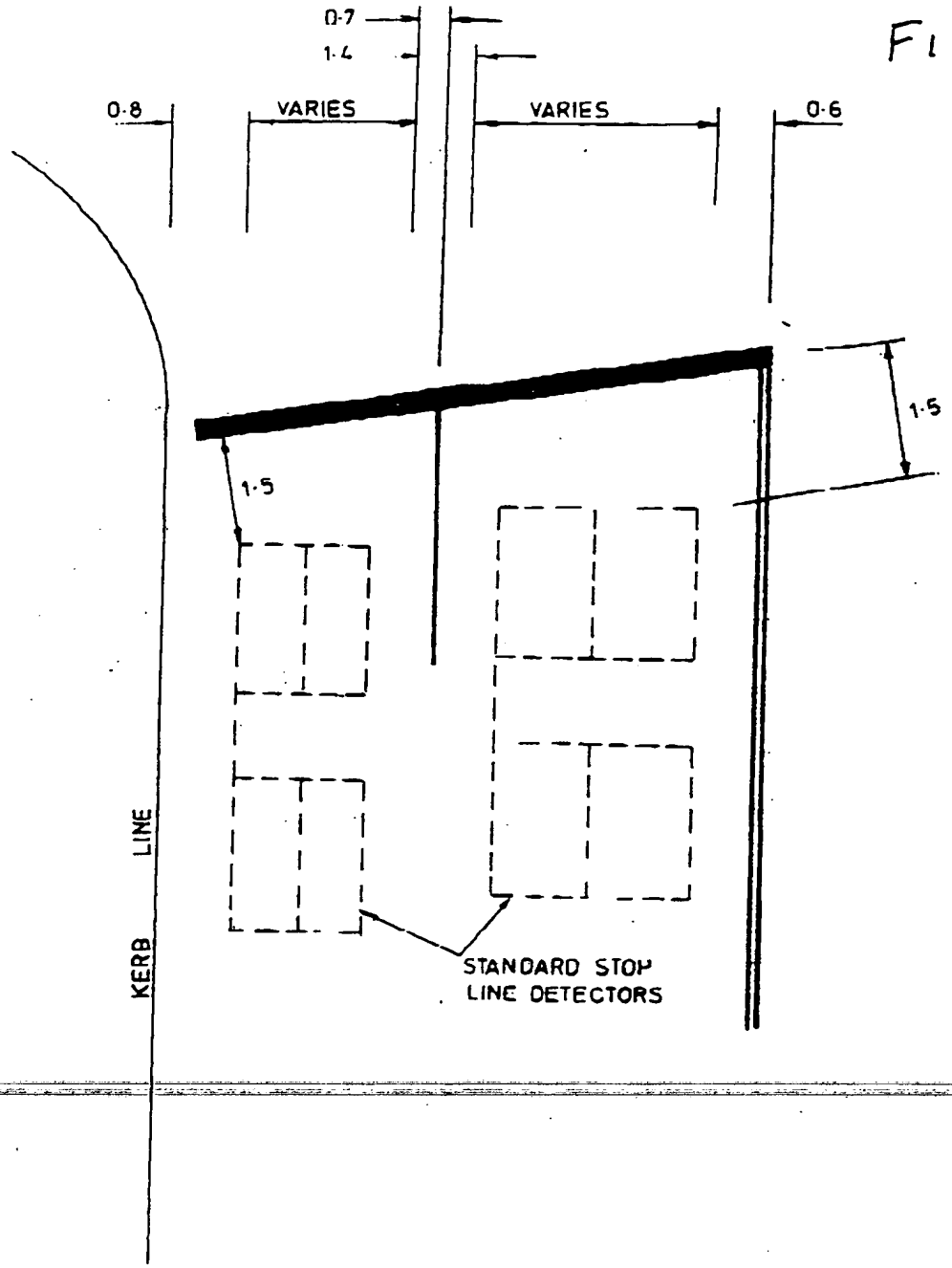
Patent Attorneys for the Applicant

H R HODGKINSON & CO.

By: H. R Hodgkinson

Registered Patent Attorney

FIG 1



STANDARD INSTILLATION
OF EZY LOOPS

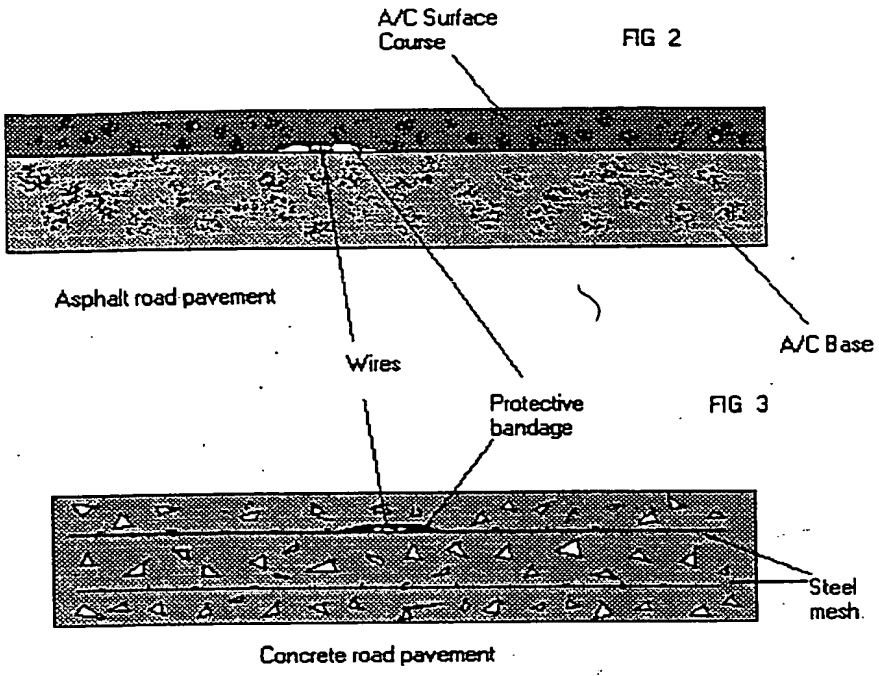

A/C Surface Course
Asphalt road pavement
Wires
A/C Base
Protective bandage
Steel mesh.
Concrete road pavement

FIG 2

FIG 3

THIS PAGE BLANK (USPTO)